

# Idaho 8th Grade Direct Mathematics Assessment

## 2004 8<sup>th</sup> GRADE MAIN RANGEFINDER 4

It is important that you show or explain how you solved the problems on this assessment. If you use a calculator, show how you set up the math.

1. Shauna has scores of 68, 92, 96, 78, 100, 93, and 86 on her math tests so far this semester.

GRADE SCALE	
A =	90 and above
B =	80 - 89
C =	70 - 79
D =	60 - 69

Advanced Communication Skills

- a. If Shauna's father gives her \$5.00 for every A, \$2.00 for every B, ~~nothing~~ for a C, and Shauna must give her father \$1.00 for every D, how much ~~money~~ would she have from this? Show or explain how you found your answer.

$\textcircled{A} 4 \cdot 5 = \$20.00$      $\textcircled{D} 1 \cdot -1 = \$-1.00$

$\textcircled{B} 1 \cdot 2 = \$2.00$   
 $\textcircled{C} 1 \cdot 0 = \$0.00$

$$\begin{array}{r} 20.00 \\ + 2.00 \\ \hline \$22.00 \\ - 1.00 \\ \hline \$21.00 \end{array}$$

- b. What is her average (mean) test score and letter grade? Show or explain how you found your answer.

$100 + 96 + 93 + 92 + 86 + 78 + 68 =$

$613 \div 7 = 88 = \textcircled{B}$

- c. Shauna's lowest score is what percentage of her total points? Show or explain how you found your answer.

$\frac{\text{lowest score}}{\text{total}} = \frac{68}{613} = \textcircled{11\%}$

- d. If one more 100-point test is given, what would be her highest possible average (mean)? If two more 100-point tests are given, what would be her highest possible average (mean)? Show or explain how you found your answer.

$1 \text{ more test} = 713 \div 8 = \textcircled{89 = B}$   
 $2 \text{ more tests} = 813 \div 9 = \textcircled{90 = A}$

Advanced Application of Basic Skills

Well-Defended Solution

Read problems 2, 3, 4, and 5 on this and the next two pages. Select three problems to answer. Answer ALL of the parts of the three problems you select to answer. Cross out the one problem that you do not choose to answer.

2. Given the following sequence: 1, 4, 9, 16, ...

a. Find the next three terms (numbers) in the sequence.

25, 36, 49

b. What is the relationship between the numbers? Show or explain the pattern.

$$1 + 3 = 4 + 5 = 9 + 7 = 16 + 9 = 25 + 11 = 36 + 13 = 49$$

every odd number starting at 3

Appropriate Processes  
Accurately Completed

c. Find the mean and median of the seven numbers. Show or explain how you found your answer.

$$1 + 4 + 9 + 16 + 25 + 36 + 49 = 140 \div 7 = 20 \text{ is the mean}$$

16 and 25 are the median or middle numbers

Minimal or Non-Existent Errors

d. Find the probability of selecting an odd number from the seven numbers. Show or explain how you found your answer.

$$\frac{4}{7}$$

57%

Four out seven of the numbers are odd

**Advanced Use of Symbols and Communication Skills**

3. In the game of basketball, the "key" is the rectangular area underneath the basket. A school has decided to paint the key and the semicircle adjacent to and outside of the free throw line with the school's colors. The dimensions of the key are 12 ft by 19 ft as shown in the diagram.

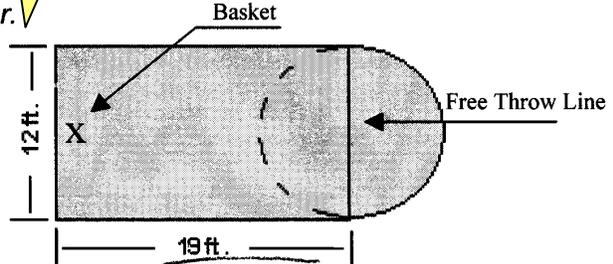
- a. What is the total area to be painted (key and semicircle)? (Circle Area Formula:  $A = \pi r^2$ ) Show or explain how you found your answer.

$$\frac{12}{2} = 6$$

$$12 \cdot 19 = 228 \text{ ft}^2$$

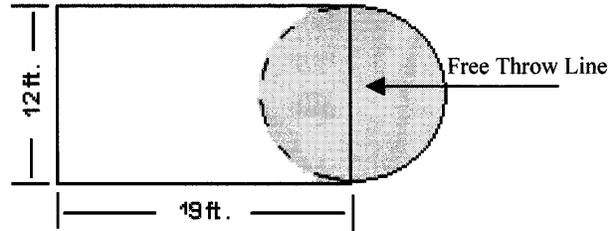
$$\pi \cdot 36 = \frac{36\pi}{2} = 18\pi \approx 57 \text{ ft}^2$$

$$228 + 57 = 285 \text{ ft}^2$$



- b. The school will paint the circle orange that has the free throw line as the diameter. What is the area that needs to be painted orange? Show or explain how you found your answer.

$$\pi \cdot 36 = 36\pi \approx 113 \text{ ft}^2$$



**Higher-Order Thinking Skills (Analysis, Synthesis, and Evaluation)**

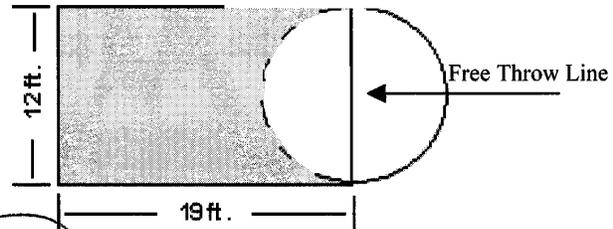
- c. The remaining area of the key is to be painted black. What is the area that needs to be painted black? Show or explain how you found your answer.

$$12 \cdot 19 = 228 \text{ ft}^2$$

$$\pi \cdot 36 - \frac{36\pi}{2} = 18\pi = 57 \text{ ft}^2$$

$$\begin{array}{r} 228 \\ - 57 \\ \hline 171 \end{array}$$

$$171 \text{ ft}^2$$



- d. The cost of the paint is \$2.50 per sq. ft. of coverage. How much would it cost to paint the key and the adjacent semicircle? Show or explain how you found your answer.

$$\text{Total area} = 285 \text{ ft}^2$$

$$285 \cdot 2.50 = 712.50$$

4. Suppose you plan to work 3 hours after school each Monday, Wednesday, and Friday, and 6 hours each Saturday. Suppose you will earn  $x$  dollars per hour.

a. Write an expression that represents your weekly earnings. *Show or explain how you found your answer.*

$$3 \cdot 3 = 9 + 6 = 15$$

$$15 \cdot x = \text{weekly earnings}$$

b. If you earn \$5.25 per hour, how much money will you earn each week? *Show or explain how you found your answer.*

$$15 \cdot 5.25 = \$78.75$$

Advanced Understanding  
of Situations

c. If 25% of your weekly check in part b is deducted for taxes, how much will you pay in taxes each week? *Show or explain how you found your answer.*

$$\frac{78.75}{4} = \$19.69$$

Effective Problem-Solving  
Strategies

5. An art teacher has a box of 36 markers on his desk that are black, red, green, blue, and purple.

a. If 25% of the markers are blue and  $\frac{1}{3}$  of the markers are black, how many markers are blue and how many markers are black? *Show or explain how you found your answer.*

b. If there are an equal number of red, green, and purple markers, how many green markers are in the box? *Show or explain how you found your answer.*

c. If Johnny reaches into the box and grabs one marker without looking, what is the probability that the marker will be blue or red? *Show or explain how you found your answer.*